(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 061 432**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **82830055.8**

(51) Int. Cl.³: **B 65 H 67/06**

(22) Date of filing: **12.03.82**

(30) Priority: **25.03.81 IT 8335081**

(43) Date of publication of application:
29.09.82 Bulletin 82/39

(84) Designated Contracting States:
AT BE CH DE FR GB LI LU NL SE

(71) Applicant: **OFFICINE SAVIO S.p.A.**
Via Udine 105
I-33170 Pordenone(IT)

(72) Inventor: **D'Agnolo, Armando**
Via Zuccolo
I-33080 Porcia (PN)(IT)

(74) Representative: **Petraz, Gilberto**
G.L.P. S.a.s. di Gilberto Petraz P.le Cavedalis 6/2
I-33100 Udine(IT)

(54) Device for conveying cops.

(57) The invention concerns a device for conveying cops and winding tubes at one and the same time between a spinning frame and the relative winding heads, said device comprising a powered closed-ring conveyor means (24) revolving in a substantially horizontal plane along each side of the spinning frame between one end of said spinning frame (20) and the point of delivery (23-123) of the cops (25) to the winding heads (21) pre-disposed downstream from said spinning frame (20), a plurality of means (31) carrying the cops (25) or tubes (26) and anchored to said conveyor means, and guide means (29) for said carrying means (31), whereby means (27) for loading tubes are visualized and said cops (26) doffed from the spindles of the spinning frame (20) are conveyed on one side of the closed-ring conveyor means (24), whereas the tubes (26) to be fitted to the spindles of said spinning frame (20) are conveyed advantageously on the other side of said conveyor means (24).

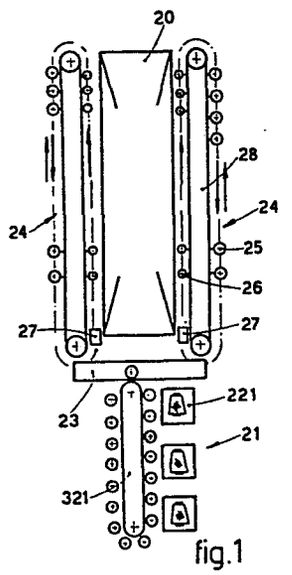

fig.1

EP 0 061 432 A1

0061432

Classe Int n).

ril SIP 4-3198

Description of the invention entitled:

"DEVICE FOR CONVEYING COPS"

in the name of OFFICINE SAVIO Spa at Pordenone

This invention concerns a device to convey winding tubes and cops at one and the same time for a spinning frame advantageously linked to a plurality of winding heads.

To be more precise, this invention concerns a closedring type conveyor device able to transfer winding tubes and cops at the same time from a spinning frame directly, or through an intermediate station, to the turntable serving a plurality of winding heads.

Systems are known which combine a spinning frame together with a plurality of winding heads. Said known systems comprise various means and methods for conveying cops and tubes between the working units.

The system for conveying cops and tubes between spinning frame and winding machine as proposed in patent application IT 22362 A/78 (Japanese priority No. 43739 of 15.4.1977) in the name of Kuraray Co. Ltd. is known wherein one of two horizontal conveyor belts are envisaged as circulating near to each side of the spinning frame and as having on their movable surface some pins which convey the tubes and cops.

In that system, if there is only one conveyor belt, said belt discharges all the cops of a doffing at the station down-

Gilbert Petraz

stream and receives at the upstream end of the spinning frame the tubes for the next loading of the spinning frame.

The tubes are conveyed from the winding machine to said upstream end of the spinning frame by means of conveyors for tubes acting in the direction opposite to that of the forward movement of said conveyor belt.

If there are two conveyor belts positioned one on each side of the spinning frame, the aforesaid system visualizes that the tubes and cops are conveyed separately in the same direction towards the winding machine, while said means for conveying tubes to the upstream end of the spinning frame are still included.

This system has a limited output if there is only one single one-way conveyor belt bearing the doffed cops and the tubes to replace the same, and the system is expensive if it is employs two separate conveyor belts moving in the same direction.

Patent USA No. 3,154,904 comprises a spinning frame linked at its end to a winding machine. In said patent the doffed cops lie horizontally on a conveyor belt, which takes them to a second conveyor belt that turns them and delivers them to appropriate sloped cop containers pre-arranged in the turntable of the winding machine.

This patent does not visualize the re-delivery of tubes to the spinning frame nor the replacement of doffed cops with fresh tubes.

Patent USA No. 3,132,463 comprises a spinning frame linked to a winding machine and an endless chain pre-arranged above the spinning frame and installed on a carriage which can be moved vertically or horizontally.

Said continuous chain is provided with special grippers able to clamp the cops (or tubes) at their end from above and to lift them.

Gilberto Petrar

Said system needs tubes of a particular kind and involves a drawback relative to the movements of the carriage bearing the endless chain since it requires towing means and accurate means to control said movements.

French patent No. 76.30435 also comprises a system for conveying suspended cops or tubes, whereby clamping means which are a part of the chain and cooperate with the neck of the tube are envisaged on said endless chain, which itself too is suspended. Said clamping means are complicated and expensive to make.

Patent FR 7320741 has a system for conveying bobbins by suspension on supports which can move on rail means hung over the working units.

This system is intended to convey bobbins between two groups of spinning machines working in two different production phases wherein the used bobbins are merely left in a discharge station.

German patent OS 2236166,listed in Search Report RS 64099 IT made at the EPO in relation to the subject matter of this application, includes a device for moving cops and tubes between a spinning frame and a winding machine, whereby said device has a plurality of conveyor belts pre-arranged around the spinning frame and forming two closed lanes, in each of which the tubes or cops are drawn along and then transferred to the winding machine.

While they are being thus conveyed, the cops and tubes lie stretched out lengthwise on the conveyor belts, and this is a fact which can spoil the cops and the yarn wound thereupon.

Patent LU 39649 also envisages a system whereby a spinning frame cooperates with a winding machine and the cops are conveyed with one single one-way conveyor belt which revolves in a closed ring around the spinning frame.

This system needs a relatively long belt and is therefore hardly economical besides being complex and making everything complex.

The above mentioned EPO Search Report lists two other pertinent patents, namely US-A-3.195.298 and FR-A-1.517.543.

US-A-3.195.298 discloses a device in which cops produced in a spinning machine are transported to a winding machine by an endless belt conveyor whereby the cops enter into vacant winding stations of the winding machine.

According to this patent the depleted cores doffed in the winding machine pass through intermediate devices to another endless belt conveyor which feeds the empty cores to the spinning machine.

This device needs a lot of space and is fairly costly to build.

FR-A-1.517.543 on the other hand discloses a device in which a winding machine is fed with cops which are transported from a spinning machine through two transport conveyor and on accumulation conveyor.

Also this device needs a considerable space and the need to pass the cops through three conveyors make it rather complicated and slow.

Another drawback of this lay-out is that the cops and any tubes to replace them are all conveyed on one and the same lane.

One purpose of the present invention is to embody a system and the relative means to convey cops and tubes at the same time, whereby the system overcomes the aforesaid drawbacks relative to the known art.

Another purpose of this invention is to simplify the means conveying cops and tubes between a spinning frame and the winding heads pre-arranged downstream therefrom.

Yet another purpose of the invention is to embody a sys-

tem conveying cops and tubes which enables said cops and tubes to be moved readily between the working units and enables the cops and tubes to be easily handled by conveying then on anchorage pins.

One advantage of the invention is that it enables any doffing system and any system to find the tail-end of the cops to be employed.

Another advantage of this invention is that it permits the cops and tubes to be conveyed along straight and curved paths.

Yet another advantage is an outstanding increase in the capacity for doffing the cops and transferring them from the spinning frame to the winding heads and the short conveying times.

This invention is embodied in a device for the simultaneous conveying of cops and tubes between a spinning frame and the relative winding heads, whereby the device consists of a powered conveyor means formed as a closed ring and rotating in a horizontal plane along each side of the spinning frame between one end of said spinning frame and the point which supplies the winding heads pre-arranged downstream from said spinning frame.

The invention also envisages a plurality of means anchored to said conveyor means and carrying the cops and tubes, and also guide means for said carrying means.

According to the invention, means for loading tubes are visualized as being pre-disposed near the point of exit of the cops from said conveyor means.

According to the invention the cops doffed from the spinning frame are conveyed on one side of the closed-ring type conveyor means, whereas the tubes to be fitted onto the spindles of said spinning frame are conveyed on the other side of said conveyor means.

Gilberto Petraz

According to one lay-out of the invention the cops discharged are transferred directly from the conveyor means to the turntable feeding the winding heads.

When such is the case, the forward movement of said conveyor means is carried out step by step, depending on the summons coming from said turntable.

According to another lay-out of the invention the cops discharged are transferred indirectly to the turntable feeding the winding heads through an intermediate storage or reserve station positioned between the spinning frame and the winding heads.

In such a case the forward movement of said conveyor means can be continuous or discontinuous and be regulated in either case by suitable signals coming from the intermediate reserve station.

According to the invention again, said conveyor means can be embodied with any material or can consist of chains, metal cables or another material, suitable for the purpose, to which the means bearing the tubes or cops are anchored.

It should be emphasised that, when a chain or cable is used, the conveyor means according to the invention permit, whenever necessary, the tubes or cops conveyed to be sloped in respect of their vertical axis owing to the rail-wise or strip-wise guide means, which can be suitably shaped along their development.

This ability can possibly be used advantageously either for the discharging of the tubes and cops from the belt means or for loading empty tubes on said conveyor means.

Moreover, according to the invention it is possible to fit on each means bearing the cops a pincer means to grip the tail-end of the yarn.

It is also possible to visualize that the search for the end of the yarn is carried out on all the cops arriving at

Ottorino Petraz

a station envisaged as being at the point where the cops leave the conveyor means.

We shall describe hereinafter as examples some preferential embodiments of the invention and some alternative embodiments of the conveyor means, using the tables to help us, wherein:

Fig. 1 shows a conveyor device according to the invention which delivers the cops to an intermediate storage station;

Fig. 2 shows the conveyor device which delivers the cops directly to the turntable feeding the winding heads;

Figs.3 to 9 show variants of the conveyor means embodied with a closed-ring belt;

Fig.10 shows a variant of the conveyor means embodied with a closed-ring cable;

Fig.11 shows a variant of the conveyor means embodied with a chain.

In the figures the same parts or parts having the same functions bear the same reference numbers.

Fig. 1 shows a spinning frame 20 cooperating with a winding machine 21 which has a plurality of winding heads 221 and a feeder turntable 321.

Between the spinning frame 20 and winding machine 21 is an intermediate storage station 23 whereinto are deposited the cops coming from the spinning frame before they are transferred to the turntable 321 of the winding machine 21.

The device according to the invention bears the reference number 24 and comprises a pair of conveyor means 24 predisposed to correspond with each side of the spinning frame 20.

Said conveyor means 24 rotate in a horizontal or almost horizontal plane and, in our example, bear on their outer side the cops 25 doffed from said spinning frame up to the

storage or reserve station 23.

At the same time as the cops 25 are being conveyed on one side, the tubes 26 are conveyed instead on the other side up to said spinning frame, having been taken from a station to load empty tubes 27 pre-disposed in the part downstream from the spinning frame 20.

Said conveyor means 24 each consist of belt means, or chain means, or cable means, closed in a ring and rotating in a substantially horizontal or almost horizontal plane parallel to the side of the spinning frame.

In this embodiment the cops 25 deposited in the intermediate storage station 23 are moved with known means (and therefore not described here) to the turntable 321 of the winding machine 21.

The forward movement of said conveyor means 24 is governed by signals coming from said storage station 23, which regulate the action of motor means (not shown here) towing said conveyor means 24.

Said forward movement can be step by stem, continuous or discontinuous, depending on the nature and method of working of said storage station 23.

Fig. 2 shows a variant which is substantially like the first embodiment described just now but wherein the cops 25 are transferred substantially directly from the conveyor means 24 to said turntable 321 of the winding machine 21.

The transfer takes place in a station 123 for direct transfer of the cops 25 from the conveyor means 24 to the turntable 321.

In this variant it is clear that the conveyor means 24 are able to carry the cops 25 and tubes 26 along a path which is both straigth and curved, and this fact provides outstanding advantages.

The forward movement of the conveyor means 24 can ideal-

ly be step by step, and in such a case said movement is governed by appropriate signals coming from the turntable 321 and controlling the motor means of the conveyor means 24.

In the two lay-outs described the cops 25 are doffed from the spinning frame 20 and pre-disposed on suitable carrying means 31 arranged at the side of and on said conveyor means 24 and are conveyed to the turntable 321 of the winding machine 21 by the rotation of the conveyor means 24.

In the meanwhile the returning side of said conveyor means 24 is loaded with fresh tubes 26, which are arranged thereafter on the spindles of said spinning frame.

Fig. 3 shows a crosswise section of conveyor means 24 consisting of a fixed carrying structure 28 formed with a lower 228 and an upper 328 part.

Both the parts 228 and 328 are equipped with lengthwise guide grooves 29 that enable the belt 30 to follow a closed-ring path.

Said guide grooves 29 lie substantially near to the edges of the carrying structure 28 and are able to guide a closed-ring type powered conveyor belt 30 in the cases of Figs. 3 to 9 inclusive, the belt 30 being pre-disposed so as to run with its outer surface substantially upright.

Said conveyor means 24, as shown in Figs. 3-9, comprise means 31 carrying both cops 25 and tubes 26, said means 31 being fixed at the outside of and at the side of said belt means 30.

In our examples said carrying means 31 consist substantially of an L-shaped pin fixed to the belt 30, while their upright part has a tapered shape advantageously and comprises a diameter that cooperates with the inner diameter of the tube 26 to be conveyed; this enables the tube to be lodged in a steadfast manner on said pin 31.

The embodiments shown in Figs. 4 and 5 have additional gui

ding and supporting means 33-32, which are a part of the carrying structure 28 and are able to keep the pins 31 in a substantially upright position along the transfer path if the conveyor belt 30 is made of a not so stiff material which can be bent.

The variant of Fig. 4, for instance, comprises a jutting edge 32 provided on the inner part 228 of the carrying structure 28 outside the guiding groove 29, and an inner jutting edge 33 which can be arranged either on the lower or on the upper part of the carrying structure more towards the inside than said belt 30. This enables the horizontal part of the pin 31 to run supported in a substantially horizontal position.

In the variant of Fig. 5 the edges 32 and 33 are envisaged as being farther out than said belt 30 and as being located respectively on the lower and upper parts of the carrying structure 28.

The variants of Figs. 6-7-8-9 envisage instead outer railwise guiding and supporting means 34 anchored, or not, to the carrying structure 28 and consisting of an upright or horizontal rail 34 cooperating with a corresponding groove 234 provided in the tube-bearing pin 31. Said rails 34 lie parallel to the guiding grooves 29.

In the specific case of Fig. 9 the guiding and supporting rails 34 and corresponding grooves 234 are visualized as being respectively outside and inside the pin 31 so as to ensure a more efficient action.

In the variant of Fig. 10 the belt 30 is replaced with a cable 230 to which the tube-bearing pins 31 are anchored.

In this variant the lower part 228 of the carrying structure 28 comprises a shaped part which acts as a guide strip 229 on which the lower end of the tube-bearing pin 31 runs, while the upper part 328 of the carrying structure has an

Gilberto Petraz

edge 329 protruding substantially vertically which acts as a rail and cooperates with a corresponding groove 234 located in the tube-bearing pin 31.

In all the variants it is possible to change the slope of the pin 31 and therefore of the axis of the cops 25 borne along the transfer path. This characteristic can be employed advantageously to facilitate either the removal of the cops 25 from the conveyor means 24 of the loading of the tubes 26 on the said carrying means 31.

Fig. 11 shows yet another variant wherein the conveyor means consists of a chain 330 of links, for instance, or hooks, on which the anchorage pin means 31 are disposed. In this example the links 330 have in their upper and lower edges guide means 331 able to cooperate with the edges 332 of the lower 228 and upper 328 parts of the carrying structure 28.

In Fig. 11 the means 31 bearing the tubes 26 and cops 25 are anchored to the chain 330, which cooperates with possible towing sprockets by means of the rollers 430.

Said cooperation serves as a guide for the conveyor means 330 and also as a support for the pin means 31.

It is evident that said conveyor means 30, 230 and 330 are provided with known towing means which are driven in such a way as to suit the needs of the other units in the group.

It is possible to change shapes, sizes and proportions and to add other variants or to replace the conveyor means 30, 230 and 330 with other suitable means; the type of supports for the pins 31 can be varied; it is possible to envisage means able to grip, hold and position the tail-end of the cop 25 and to cooperate with the carrying means 31, and so on.

The whole of the above is within the capacity of a tech-

nician in this field without leaving the scope of this invention.

Gilberto Patraz

CLAIMS

1 - Device for conveying cops and tubes at the same time between a spinning frame and the relative winding heads, characterized by comprising in mutual coordination and cooperation: - a closed-ring type powered conveyor means (24) revolving in a substantially horizontal plane along each side of the spinning frame between one end of said spinning frame (20) and the point of delivery (23-123) of the cops (25) to the winding heads (21) pre-arranged downstream from said spinning frame (20): a plurality of means (31) bearing the cops (25) or tubes (26) and anchored to said conveyor means: and guide means (29) for said bearing means (31), whereby means (27) to load tubes are visualized, and said cops (25) doffed from the spindles of the spinning frame (20) are conveyed on one side of the closed-ring conveyor means (24), whereas the tubes (26) to be fitted to the spindles of said spinning frame (20) are conveyed advantageously on the other side of said conveyor means (24).

2 - Device as in Claim 1, characterized by the fact that the cops (25) doffed from the spindles of the spinning frame (20) are delivered to a reserve station (23) pre-disposed upstream from the winding heads (21).

3 - Device as in claim 1, characterized by the fact that the cops (25) doffed from the spindles are delivered directly to the turntable (321) feeding the winding heads (21).

4 - Device as in claim 1 and in claim 2 or 3, characterized by the fact that said conveyor means (24) follow a straight path.

5 - Device as in claim 1 and in claim 2 or 3, characterized by the fact that said conveyor means (24) follow a path which is at least partially curved.

6 - Device as in claim 1 and in one or another of the claims thereafter, characterized by the fact that the conveyor means

(24) convey tubes (26) and cops (25) positioned alternately.

7 - Device as in claim 1 and in one or another of the claims thereafter, characterized by having a structure (28) which bears guided and powered closed-ring conveyor means (30-230-330) that revolve aroubd the edges of said bearing structure (28) and uphold the means (31) carrying the tubes (26) and cops (25).

8 - Device as in claim 1 and in one or another of the claims thereafter, characterized by the fact that said conveyor means consist of a substantially flexible closed belt (30) which is made of any suitable material and upholds the means (31) carrying the tubes (26) and cops (25).

9 - Device as in claim 8, characterized by the fact that said closed belt (30) is guided along its path by groove means (29) arranged along the edges of the lower (228) and upper (328) parts of said bearing structure (28).

10- Device as in claims 8 and 9, characterized by the fact that said bearing structure (28) has supporting and guiding means (32-33) for the carrying means (31), said supporting and guiding means (32-33) being pre-disposed outwards and/or inwards in respect of the closed belt (30) and being anchored to both the lower and upper parts (228-328) and along the groove means (29).

11- Device as in claims 8 and 9, characterized by comprising rail-wise guiding and supporting means (34) stretching along the path of the conveyor means (24) and consisting of one or more rails cooperating with one or more grooves (234) provided in the carrying means (31) so as to coincide with said guiding and supporting means (34).

12- Device as in claim 1 and in one or another of the claims thereafter up to claim 7 inclusive, characterized by the fact that the closed-ring conveyor means (24) consist of a cable (230) upholding the carrying means (31) and cooperating with

a strip (229) machined in the lower part (228) of the strcture (28), whereby the upper part (328) is provided with a rail (329) cooperating with the groove (234) envisaged in the body of the carrying means (31).

13 - Device as in claim 1 and in one or another of the claims thereafter up to claim 7 inclusive, characterized by the fact that the closed-ring conveyor means (24) consist of a chain (330) which is preferably made of links and upholds the carrying means (31).

14 - Device as in claims 1 and 13, characterized by the fact that the chain (330) comprises hook-wise bends (331) cooperating with guides (332).

15 - Device as in claim 1 and in one or another of the claims thereafter, characterized by the fact that each of the carrying means (31) consists of a pin fixed to the outside of the conveyor means (24-30-230-330) and has a substantially upright part with a tapered shape and with a maximum diameter slightly smaller than the inner diameter of the tube to be conveyed.

16 - Device as in claim 1 and in one or another of the claims thereafter, characterized by the fact that the carrying means (31) comprise means to grip the tail-end of the cop (25).

Gilberto Petraz

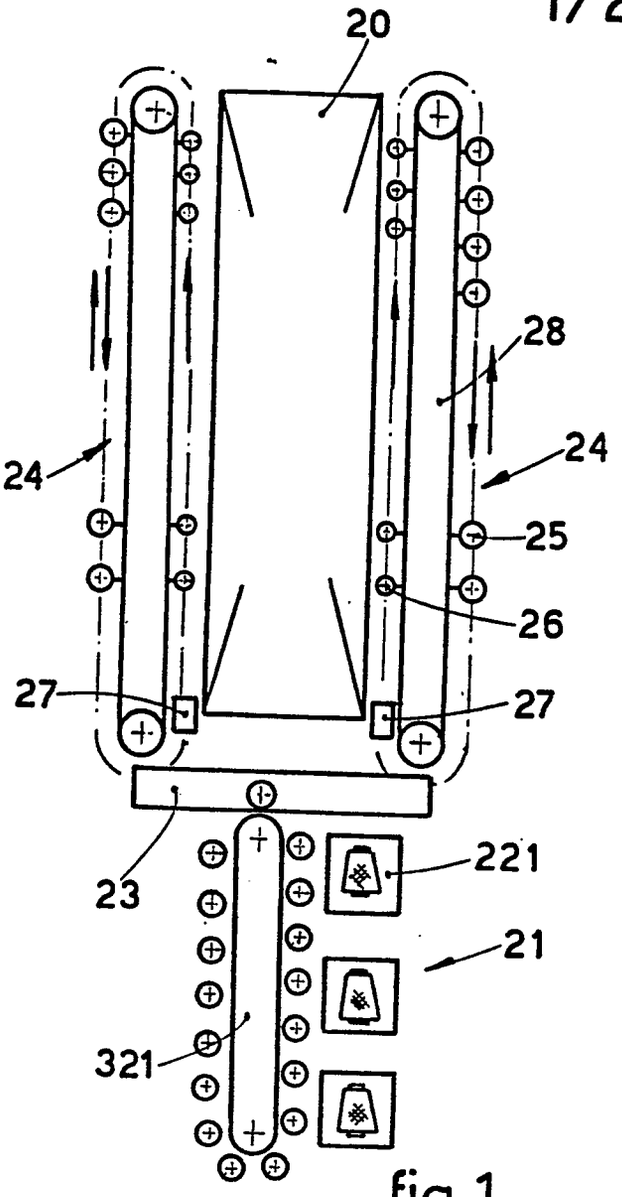

fig.1

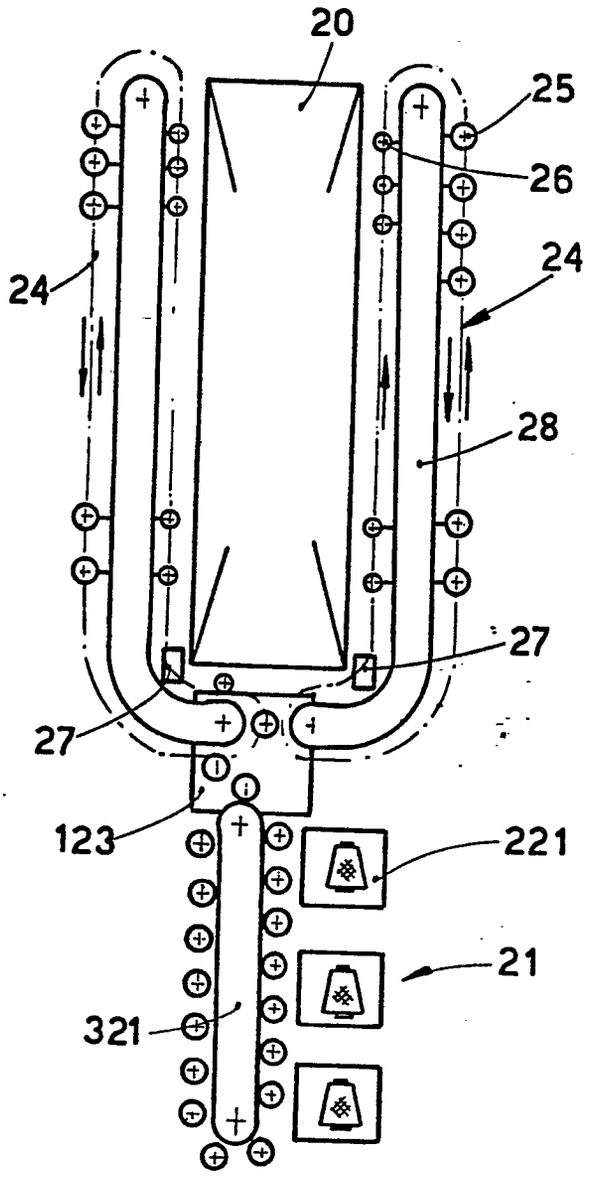

fig.2

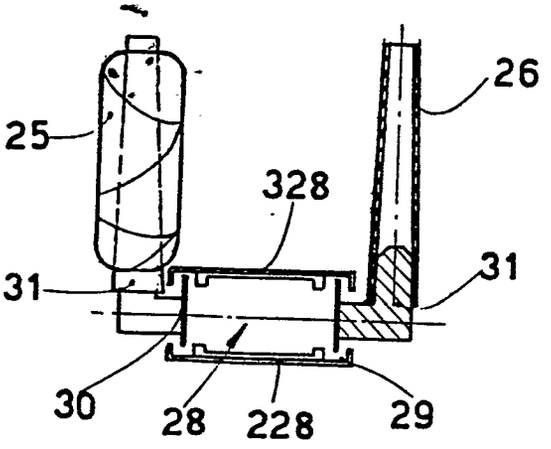

fig.3

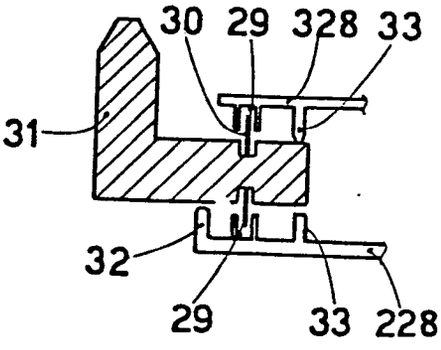

fig.4

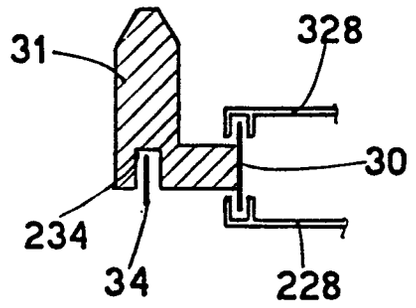

fig.6

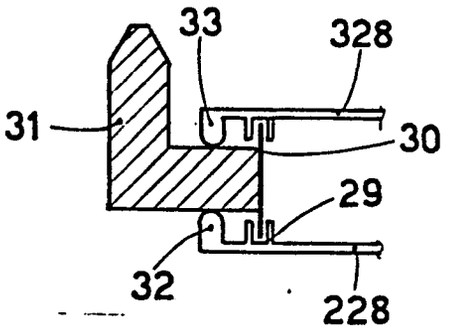

fig.5

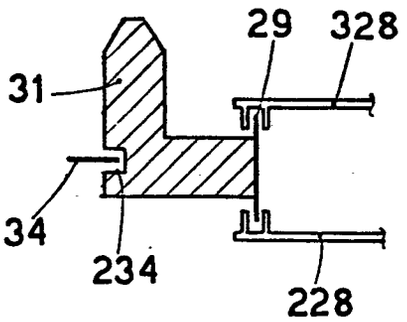

fig.7

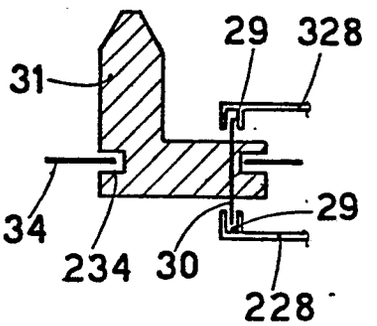

fig.8

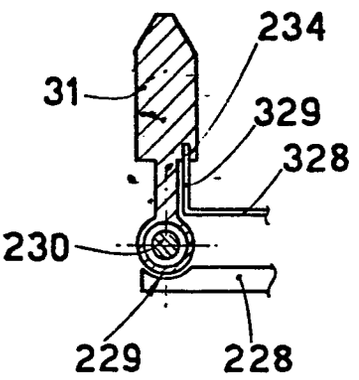

fig.10

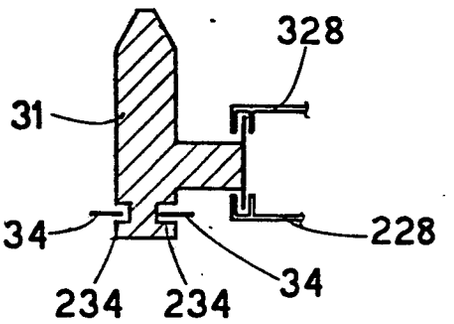

fig.9

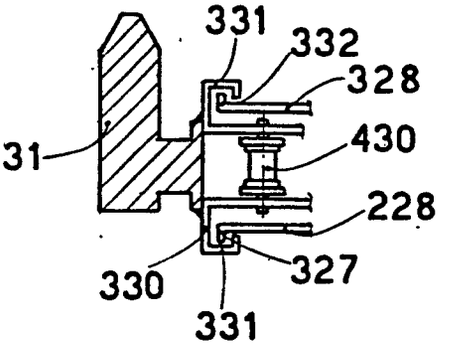

fig.11

European Patent Office

EUROPEAN SEARCH REPORT

0061432
Application number

EP 82 83 0055

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
D,A	DE-A-2 236 166 (LEESONA CORP.) *The whole document*	1-5	B 65 H 67/06
D,A	FR-A-1 517 543 (KURASHIKI) *The whole document*	1-4,8	
D,A	US-A-3 195 298 (W.REINERS) *The whole document*	1-4	

TECHNICAL FIELDS SEARCHED (Int. Cl. ³)

B 65 H
D 01 H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	21-06-1982	DEPRUN M.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO Form 1503. 03.82